Original Research Report

The Effectiveness of the Assessment of the Sedation Scale in Adult Critical Patiets with Ventilators: Literature Review

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Abstract: Critical patient is a condition that may have reversible dysfunction of one of the organs that threaten life and requires treatment in the Intensive Care Unit. WHO reports that deaths from critical illnesses increased by 1.1-7.4 million people and 9.8-24.6 critically ill patients admitted to the ICU. The patient will experience a decrease in physical and cognitive function so that the use of a ventilator is important to help the breathing apparatus, but if it is prolonged it will have a negative impact so that the use of sedation is also important to be given. Nurses need to determine the sedation scale in order to determine whether or not the use of sedation is effective in these patients. This study aims to know the effectiveness of the assessment of the sedation scale in adult critically ill patients who are on a ventilator. Literature review research design was employed. Journal criteria are filtered based on literature titles, abstracts and keywords or keywords that have been determined and sourced from PubMed, Biomed Central, DOAJ, Google and Google Scholar identified through the Population, Interventions, Comparison, Outcomes and Study Design (PICOS) system approach. The number of articles used is 10 journals. Based on the results of the literature that has been reviewed by researchers from 10 journals, it is stated that the effective sedation scale ranges are RASS 63.5%, RSS 3.6% and SAS 30.4%. Therefore, the use of RASS is more effective in assessing the patient's sedation status, because RASS has accuracy and clarity in distinguishing measuring sedation status from evaluating consciousness and assessing simple reactions.

Keywords: Adult Critical Patient, Sedation Scale Assessment, Ventilator.

1. Introduction

Critical patients are conditions that have the potential for reversible dysfunction in one or more organs that are life threatening and require treatment in the Intensive Care Unit (ICU) [1]. Critical patients have various risks of health problems that can arise during the treatment process. One of the health problems that arise is a decrease in physical function while the patient is being treated in the ICU, during treatment in the ICU the patient will be at risk of experiencing a decrease in physical function that can persist for a long time and needs to be resolved immediately [1].

According to the World Health Organization reports that deaths from critical to chronic illnesses in the world increased by 1.1-7.4 million people and there were 9.8-24.6 critically ill patients treated in the ICU per 100,000 population. This situation has an impact on decreasing the quality of life which is increasingly difficult to prevent and the prevalence of the problem is increasing.

The use of a ventilator in critically ill patients plays an important role, the ventilator is a negative or positive pressure breathing apparatus that produces controlled air in the airway so that the patient is able to maintain ventilation and provide oxygen for a long time. The purpose of using a ventilator is to maintain optimal alveolar ventilation in order to meet the patient's metabolic needs, correct hypoxemia and maximize oxygen transport.

The prevalence for the use of mechanical ventilators based on the results of research from Brahmani at Sanglah Hospital for the period January - December 2015 was 61.5%. This figure is lower than the results of a study on the description of the use of mechanical ventilators carried out in the ICU of Arifin Achmad Hospital Pekanbaru for the period January - June 2012 which showed the prevalence of patients with mechanical ventilators was 77.4%. Another study conducted in Brazil, prevalence in ICU with mechanical ventilation is 51%.

On the other hand, the use of a mechanical ventilator has an impact on the patient, namely by feeling uncomfortable and agitation can occur, therefore sedation is necessary. Agitation can occur in 71% of patients in the ICU [2]. Most of the patients admitted to the ICU, are unable to communicate what they feel and need.

The use of sedation in critically ventilated patients has a very large role. Sedation is a technique of administering sedatives or dissociative drugs with or without analgesia to achieve a state that allows the patient to accept unpleasant procedures, while maintaining cardiovascular and respiratory function.

The sedation procedure aims to reduce consciousness while maintaining the patient's ability to maintain oxygenation and control the airway itself [3]. Based on the data obtained by Rakhman's research [4], the range of the sedation scale of patients admitted to the ICU (Intensive Care Unit) measuring the level of sedation using the RASS scale showed that the -4 and -5 (coma) scales were 47%, and -1 to - 3 (sedation) 62% and 0 (calm) scale 0.4%.

Several sedation scales have been tested in many studies on various parameters, but there are still difficulties in determining the degree of sedation in critically ill patients because there is no gold standard in its assessment. So the need for an assessment of the level of sedation using a sedation scale has a positive impact on the accuracy of the use of sedation drug doses, the frequency of suitability of the sedation level with the patient's condition is greater. As well as reducing the incidence of insufficient or excessive sedation, reducing the dose of analgesic and sedative drugs, as well as the duration of patient care with the help of ventilation, mechanics, namely by looking for more precise instruments in measuring sedation in critically ventilated patients.

2. Literature Review

According to the American Association of Critical Nursing, critically ill patients are patients who have a high risk of actual or potential life-threatening health problems. The more critically ill the patient is, the more vulnerable the patient's health is unstable and complex, requiring intensive therapy and careful nursing care. Pathophysiological deterioration can lead to death, ER, ICU, and ICCU are treatment rooms to treat critically ill patients where the patient's condition can deteriorate rapidly and may end in death. The classification of patients in need of critical care should focus on the level of care required by each individual regardless of where they are located.

Mechanical ventilation is the process of using equipment to facilitate the transport of oxygen and carbon dioxide between the atmosphere and the alveoli for the purpose of increasing lung gas exchange, while a ventilator is a negative or positive pressure breathing apparatus that can maintain ventilation and oxygen delivery for long periods of time.

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or anything that is described as tissue damage. Pain is subjective, the standard assessment of pain intensity is based on the statement of the patient concerned. A comprehensive assessment of pain requires objective evaluation through observation of several pain indicators.

Sedation is a state in which the loss of consciousness by using pharmacological agents, this effect occurs when the pharmacological agent binds to the GABA receptor, causing hyperpolarization and decreased excitation. In addition, it can cause muscle relaxation and reduce motor nerve activity and suppress locomotor activity. Sedation can be divided into 3, minimal sedation, moderate sedation, deep sedation. Minimal sedation is a condition in which during drug-induced the patient responds normally to verbal commands but cardiovascular and respiratory functions have no effect. Moderate or conscious sedation is a drug-induced state of consciousness in which the patient is still able to respond to commands.

Currently there is no ideal sedative, almost all the use of sedative drugs have side effects for patients who use it for a long time during treatment in the ICU. The ideal sedative drug must have hypnotic, axiolytic, amnesiac, anticonvulsant properties, not easily accumulate, titrate the sedative effect, be non-toxic, have minimal effect on the cardiovascular system, do not metabolize through the liver and kidneys, have a short onset and duration of action, has no effect on physiology and memory and does not interact with other cheap and stable drugs.

3. Methods

The method used is a literature review. The data search strategy for this literature uses an electronic based and that has been accredited, including Biomed Central, Pubmed, Google, Google Scholar, DOAJ. Determination of criteria in this literature using the PICOS framework [4] [5] [6]. For results the findings are in accordance with the following criteria:

Tabel 1. Article Search Results

Databased	Findings	Selected Literature
Pubmed	44	2
Biomed	41	4
Doaj	12	1
Google	20	1
Google Scholar	64	2
Amount	**181**	**10**

The keywords used include shown in Table 2.

Tabel 2. Keywords

Sedation	Ventilator	Critical patient
or	or	or
Sedasi	Ventilator	Pasien kritis

4. Discussion

4.1. Ramsay Sedation Scale

This scale is still widely used with 6 levels, this sedation assessment relies on vital signs as an indicator of pain because it can be deceptive. If there is no change in the patient's vital signs, it means that there is no pain because when the patient experiences pain, communication cannot be carried out effectively between reduction and sedation.

According to research by Deli et al [7], deep sedation therapy cannot be tolerated with decreased patient consciousness, continuous sedation can be indicated including reducing intubation pressure, intracranial, surgical or complications. In this case, sedating agents are used that can affect pharmacodynamic agents, pharmacokinetics and the patient's own condition. The use of Ramsay Sedation Scale (RSS) is said to be 65% while the assessment of doctors and pharmacists is 90% with the alpha value of RSS being 0.05 to 80% power. In the publication in Doel's research, RSS has a

slow response to stimuli, patients experience anxiety and anxiety because when sedated the patient falls into one level of sedation, but this variability is subjective in general.

In a study conducted by Rasheed [8] stated that RSS was initially developed only for patients who were anesthetized to monitor the level of sedation whereas evaluation of sedation was a maneuver. Bedside where the nurse's role is very important in observing patients during treatment, especially in patients who are under the influence of sedation. In this study, sedation was administered by means of a continuous infusion which was the most commonly administered. The RSS score of 89.8% was in the sedation range of 3.6% while the scores for agitated were 6.6% and 0% for the cooperative and oriented range of scores. RSS has limited ratings for agitation and anxiety states.

In assessing sedation and agitation in a patient, the goal of therapy is often determined by awareness with which drug to titrate the optimal target for administration. According to research conducted by Namigar et al [9] stated that the RSS scale is the most widely used in the ICU in addition to being the oldest scale RSS is also able to identify somnolence and agitation visually, but it also has drawbacks because some authors say that the RSS scale is not conclusive. In a study conducted by Deli et al [7] stated that RSS is one of the sedation measuring tools that is still widely used as a guide to ensure the use of drug doses but according to Dawnson et al in this study said RSS was not able to determine the level of patient sedation. .

There are different measurements using the RSS sedation scale for patients with long weaning ventilators with a significant value of 0.002 (p<0.05) with an alpha of 5%. The initial and final scores of RSS were significant < 0.05. According to Ramsay et al; Walsh et al stated that RSS has a deficiency in the level of agitation measurement that affects the determination of dosing, the level of RSS administration is not clear on the patient's sedation status, causing sedation cannot be monitored properly. Meanwhile, according to Seidabady et al RSS is more often used in measuring sedation and agitation scales in patients but has a weakness in measuring the depth and level of the sedation scale, so it cannot be used as a basis for titrating sedation even though the RSS assessment is more subjective.

Research conducted by Rasheed et al [8] said that RSS has a limited level of measuring the sedation and agitation scale because one score only describes agitation.

4.2. Richmond Agitation Sedation Scale
The RASS assessment scale has 10 agitation scales (+1 - +4) and awareness (-1 to -5) while 0 for good sedation scale. Sedation using the RASS was measured in two stages: a verbal instruction response test.

In a study conducted by Taran et al [10] sedation for mechanically ventilated patients was medically necessary and should be managed with individual assessment according to the needs of each patient. Sedation is also influenced by the type of disease, severity and interventions that will be carried out in the patient care process. Richmond Agitation Sedation Scale (RASS) is recommended for determining the level of sedation because it is considered appropriate in the measurement of sedation between caregivers and suitability. The application of the use of sedation is checked every hour to determine whether the patient feels discomfort, so that an evaluation can be carried out with non-pharmacological assistance such as changing positions or reducing pressure on the breathing apparatus.

In the implementation of this study the sedation protocol was carried out within 24-48 hours at intervals of 2, 3, 4 hours. RASS can result in better sedation because it better measures the depth of sedation in patients which significantly reduces MV time, length of stay and reduces treatment costs.

The study of Nacul [11] stated that the use of RASS in a coma or deep sedation state had a significant effect on the ROC curve that corresponded to the DSI under test and had appropriate results. However, the authors also state that the use of this sedation scale should be considered because sedation is the cause of defective fuses and refraining from sedation when clinically reasonable. The differences between sedation levels were not significant, therefore scores were considered to be stronger on the variables.

The research of Rasheed [8] stated that the RASS score of 63.5% was in the range of sedation, % agitation score and 25.1% was a zero score. RASS 63.1% moderate sedation, 9% agitation range, 27.9% was zero. The RASS showed an exceptional level because the level of internal consistency (=989) was well characterized by the level of internal consistency of any scale (=828). RASS has consistent agreement between observers when conducting different studies so as to result in safer patient care, RASS is also said to be a clinically relevant score for tracking agitation and sedation in

patients because it is considered suitable for better understanding of both conditions namely sedation and agitation.

RASS can be used by all patients regardless of using sedatives or not, because the nurse at the bedside can observe the patient's consciousness from both sides (hyperactive or hypoactive). Because it can describe agitation, alertness and level of sedation. It can also help implement other clinical tools.

Yousefi et al [12] states that the RASS scale is clearer, more comfortable and takes less time, causing reduced ventilator time, the duration of stay in the ICU is also shorter than other scales. The use of RASS had a low effect on the number of mechanically ventilated inpatients, no significant effect on ventilation, length of stay and patient mortality.

In a study conducted by Eduard et al stated that the RASS is an ordinal score that objectively measures the level of consciousness, because it has been proven to be valid and very reliable for the assessment of critical patients with or without mechanical ventilation. The use of RASS on SOFA offers a better opportunity in the wider implementation of risk prediction tools, RASS also as a tool that has a role in predicting short-term and long-term mortality.

The research of Deli et al [7] said that the RASS is a valid and reliable measuring tool to measure the status of patients in the ICU because (r = 0.91) is more specific so that it narrows the subjective assessment. RASS is also able to separate verbal and physical responses and is able to measure the length of contact time with patients, respond to stimuli and increase sensitivity. According to Ramsay et al; Walsh et al, RASS is able to measure the quality of the level of sedation because it has the highest psychometric interrater reliability and validity assessment among other sedation scales because it is able to distinguish the level of sedation in each clinical condition.

In addition, the RASS has a high validity and reliability value to measure the level of sedation in patients receiving sedation therapy. RASS has a good correlation with Bispectal Index (BIS) EEG and Glasgow Comma Scale (GCS) scores. The research of Boettger et al [13] stated that the RASS is a medical scale designed to measure the depth of sedation in all hospitalized patients but is mostly used by mechanically ventilated patients to avoid excess or lack of sedation. Patients undergoing sedation therapy are usually given sedative drugs such as midzolam, propofol, clonidine, dexmeteomidine, antipsychotics, haloperidol and Pipamperone for 24 hours.

Research conducted by Rasheed [8] stated that sedation was the most common (38.6%), RASS with a level of internal consistency "very good" (alpha = 0.989) where RASS had consistent agreement in clinical and practice observations between each observer is different. The fact that the RASS has a very clinically relevant set of scores for assessing agitation and sedation makes it successful in patients undergoing treatment.

4.3. Sedation Agitation Scale

The SAS sedation scale has 7 levels of sedation measurement, among others: a scale of 1-3 levels of sedation, a scale of 4 cooperative and a scale of 5-7 is a scale to indicate the level of agitation. Sedation Agitation Scale (SAS) is a subjective scale in assessing sedation, this scale is used for agitation and sedation in patients in the ICU and correlates with other scales [14] [15]. The SAS has a high correlation between the SAS and RASS sedation scales. Besides being well correlated with RASS, it turns out that SAS also correlates well with RSS scale.

The positive effect of systematic evaluation of agitated pain in the ICU is very important aimed at routinely assessing critically ill patients and assessing the sedation scale. The agitated sedation scale is an instrument that allows for achieving appropriate sedation. The SAS scale determines the difference in scores achieved and then emphasizes that a more refined approach is used to titrate sedation.

It is concluded that the use of RASS is more effective in assessing the sedation status of patients, because RASS has accuracy, clarity in distinguishing measuring sedation status from evaluating consciousness and assessing simple reactions.

5. Conclusion

The effectiveness of each sedation scale assessment used varies from patient to patient. Although different, the aim of this study was to identify and analyze articles on the effectiveness of using a sedation scale in critically ill adult patients on ventilators. The results of the analysis of the journals used for this study indicate that the use of RASS is more effective in assessing the sedation status of patients, because RASS has accuracy, clarity in distinguishing measuring sedation status from evaluating awareness and assessing simple reactions.

Acknowledgments

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